
HA19508A/AMP

6-Bit D/A Converter

HITACHI

November 1996

Description

The HA19508A/AMP consists of high-speed, low-power 6-bit D/A converters. The digital and clocks inputs of these monolithic bipolar LSIs are TTL/CMOS compatible.

These devices are suitable for high-speed video processing.

Features

- High-precision 6-bit D/A conversion
- Single power supply: +5 V
- TTL/CMOS compatible clock and digital inputs.

Applications

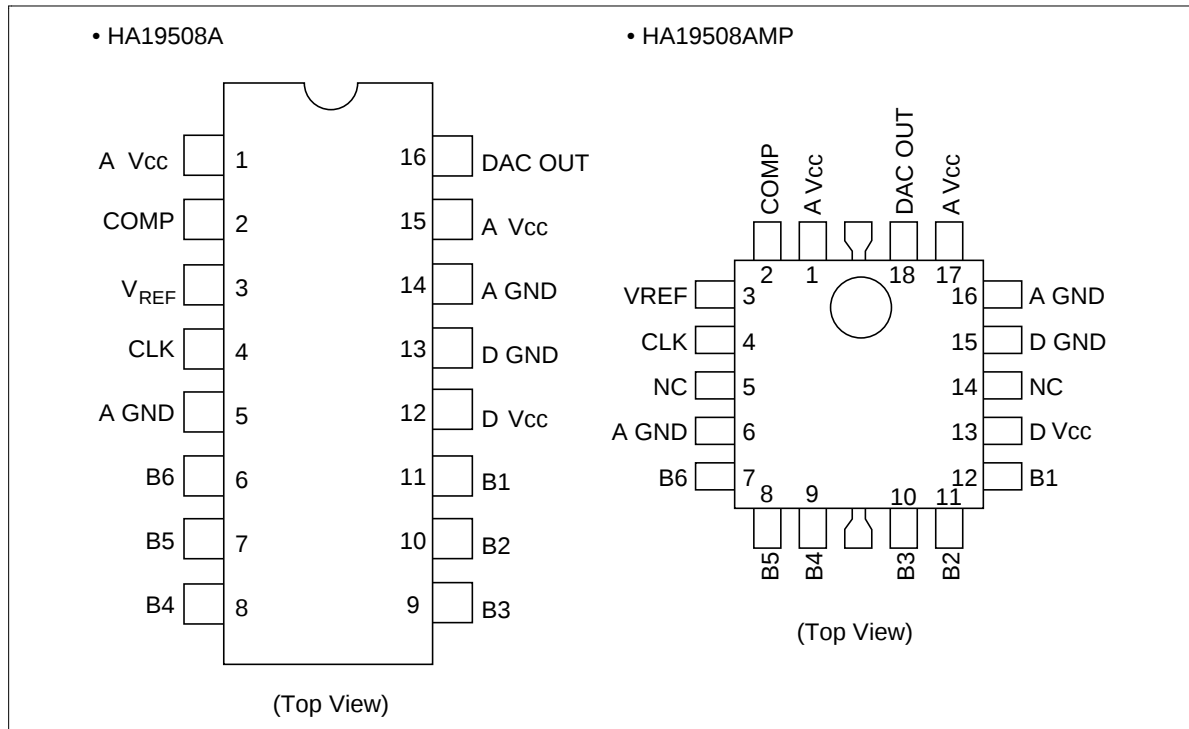
- Secondary storage devices, etc.

Ordering Information

Type No.	Package
HA19508A	300mil 16-pin plastic DIP (DP-16C)
HA19508AMP	18-pin plastic QFI (MP-18)

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Pin Arrangement

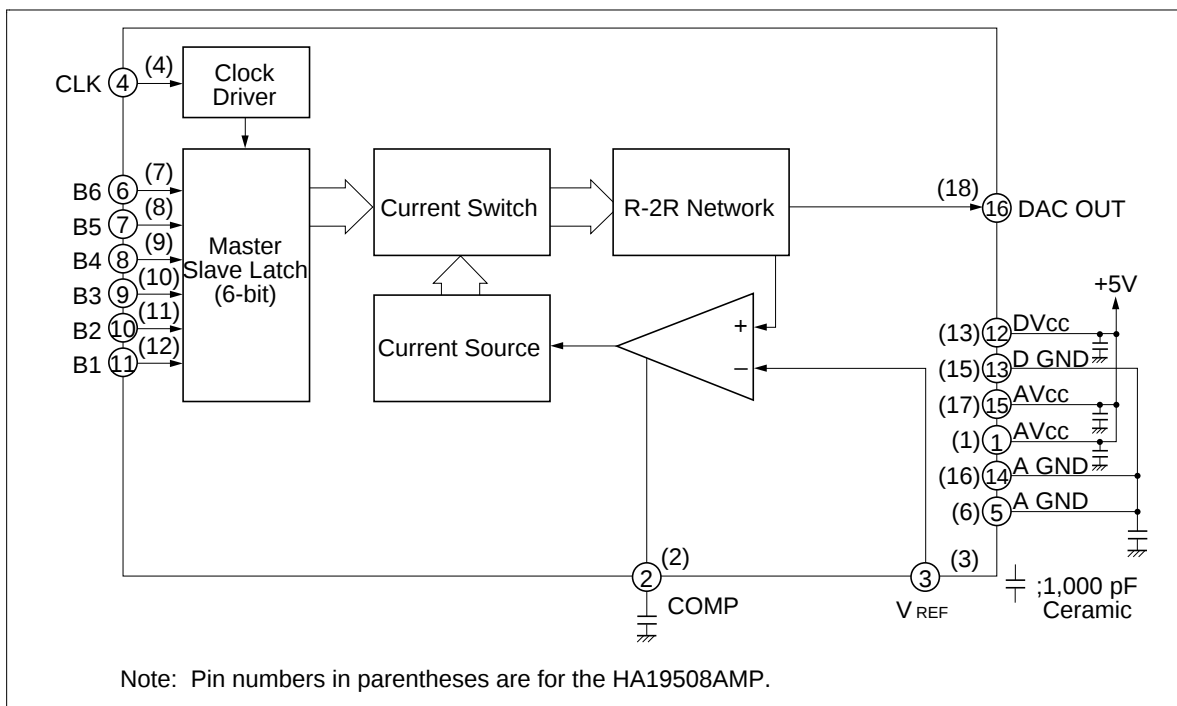


Pin Descriptions**Pin No.**

HA19508A	HA19508AMP	Symbol	Function
1	1	A V _{CC}	Analog power supply (+5 V)
2	2	COMP	Op amp phase compensation
3	3	V _{REF}	Reference voltage input
4	4	CLK	Clock input
5	6	AGND	Analog ground
6	7	B6	Digital input (MSB)
7	8	B5	Digital input
8	9	B4	Digital input
9	10	B3	Digital input
10	11	B2	Digital input
11	12	B1	Digital input (LSB)
12	13	D V _{CC}	Digital power supply (+5 V)
13	15	DGND	Digital ground
14	16	AGND	Analog ground
15	17	A V _{CC}	Analog power supply (+5 V)
16	18	DACOUT	DAC output

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Block Diagram



Absolute Maximum Ratings (Ta = 25°C, unless otherwise specified)

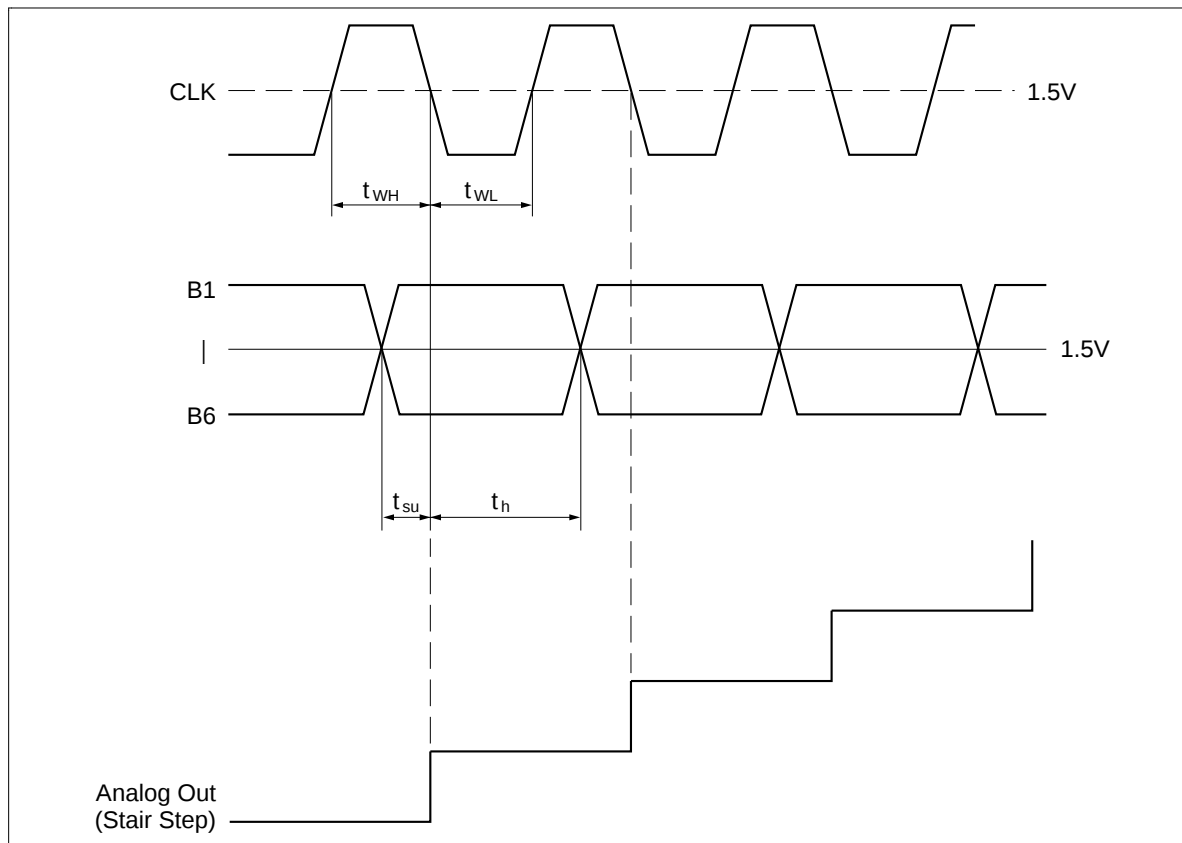
Item	Symbol	Rating	Unit
Power supply voltage	V_{CC}	+7.0	V
Digital input voltage	V_I	0 to V_{CC}	V
Power dissipation	P_T	500	mW
Operating temperature	T_{opr}	0 to +70	°C
Storage temperature	T_{stg}	-55 to +125	°C

Electrical Characteristics ($V_{CC} = 5.0 \text{ V}$, $T_a = 25^\circ\text{C}$, $V_{REF} = 4.0 \text{ V}$, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Power supply voltage	V_{CC}	4.75	5.0	5.25	V	
Analog reference voltage	V_{REF}	3.8	4.0	—	V	
Power supply current	I_{CC}	—	26	36	mA	
Conversion rate	f_{CLK}	20	—	—	MHz	
Clock pulsewidth H-level	t_{WH}	25	—	—	ns	$f_{CLK} = 20 \text{ MHz}$
Clock pulsewidth L-level	t_{WL}	25	—	—	ns	$f_{CLK} = 20 \text{ MHz}$
Data setup time	t_{su}	12.5	—	—	ns	$f_{CLK} = 20 \text{ MHz}$
Data hold time	t_h	12.5	—	—	ns	$f_{CLK} = 20 \text{ MHz}$
Digital input voltage high	V_{IH}	2.0	—	V_{CC}	V	
Digital input voltage low	V_{IL}	0	—	0.8	V	
Digital input current high	I_{IH}	−30	−5	20	μA	$V_{IH} = 2.7 \text{ V}$
Digital input current low	I_{IL}	−120	−50	5	μA	$V_{IL} = 0.4 \text{ V}$
DAC output	Full scale	V_{FS}	$V_{CC} - 15 \text{ m}$	V_{CC}	$V_{CC} + 15 \text{ m}$	V
	Zero scale	V_{ZS}	3.956	4.016	4.076	V
Reference input current	I_{REF}	−20	0.5	20	μA	
Output impedance	Z_{out}	63	80	100	Ω	
Linearity error	LE	−0.5	—	0.5	LSB	

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Timing Chart



Output Code Table

B6	B5	B4	B3	B2	B1	Aout (V)
0	0	0	0	0	0	V_{ZS}
0	0	0	0	0	1	$V_{ZS} + 1 \text{ LSB}$
1	1	1	1	1	0	$V_{FS} - 1 \text{ LSB}$
1	1	1	1	1	1	V_{FS}

Note: $1 \text{ LSB} = (V_{FS} - V_{ZS})/63$

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